

Amendment to the Claims:

Please amend the claims as follows:

This listing of claims will replace all prior versions, and listing, of claims in the application:

Listing of Claims:

Claim 1 (currently amended): A recombinant expression system ~~for processing a substantially pure enzyme~~ comprising [[:

(a)] a host cell [[capable of expressing a first nucleotide sequence]] comprising a nucleic acid encoding a phytase enzyme having the amino acid sequence as set forth in SEQ ID NO:2, [[: and,

(b) a nucleotide sequence encoding said enzyme]] wherein the nucleic acid is operably linked to a transcription control sequence controlling nucleotide sequences operable in said host cell.

Claim 2 (currently amended): A [[transfer]] vector comprising a nucleic acid (i) comprising a sequence as set forth in SEQ ID NO:1, (ii) encoding a polypeptide comprising an amino acid sequence as set forth in SEQ ID NO:2, or, (iii) encoding a phytase comprising an amino acid sequence as set forth in SEQ ID NO:2 with conservative amino acid substitutions, wherein conservative amino acid substitutions comprise replacements, one for another, among the aliphatic amino acids Ala, Val, Leu and Ile, or, interchange of the hydroxyl residues Ser and Thr, or, exchange of the acidic residues Asp and Glu, or, substitution between the amide residues Asn and Gln, or, exchange of the basic residues Lys and Arg, or, replacements among the aromatic residues Phe, Tyr, or any combination thereof, or active fragments thereof which comprises the expression system according to claim 1.

Claim 3 (currently amended): The expression system of claim 1 wherein the control [[sequences comprise]] sequence comprises a constitutive promoter.

Claim 4 (currently amended): The expression system of claim 1 wherein the control [[sequences comprise]] sequence comprises a tissue-specific promoter.

Claim 5 (currently amended): The expression system of claim 1 wherein said host cell is a prokaryotic cell.

Claim 6 (currently amended): The expression system of claim 1 wherein said host cell is a eukaryotic cell.

Claim 7 (currently amended): The expression system of claim 1 wherein said host cell is a [[higher]] plant cell.

Claim 8 (currently amended): The expression system of claim 1 wherein the nucleic acid further comprises a said first nucleotide sequence is preceded by a second nucleotide sequence encoding a signal peptide or a transit peptide operably linked to said protein.

Claim 9 (currently amended): The expression system of claim 8 wherein said signal peptide is [[the PR]] a pathogenesis-related (PR) protein PR-S signal peptide from tobacco.

Claim 10 (currently amended): A prokaryotic cell ~~modified to contain the expression system of claim 1~~ comprising an exogenous nucleic acid encoding a phytase enzyme, wherein the nucleic acid is operably linked to a transcriptional control sequence and the phytase enzyme (i) is encoded by a nucleic acid comprising a sequence as set forth in SEQ ID NO:1, (ii) comprises an amino acid sequence as set forth in SEQ ID NO:2, or, (iii) comprises a sequence as set forth in SEQ ID NO:2 with conservative amino acid substitutions, wherein conservative amino acid substitutions comprise replacements, one for another, among the aliphatic amino acids Ala, Val, Leu and Ile, or, interchange of the hydroxyl residues Ser and Thr, or, exchange of the acidic residues Asp and Glu, or, substitution between the amide residues Asn and Gln, or, exchange of the basic residues Lys and Arg, or, replacements among the aromatic residues Phe, Tyr, or any combination thereof, or active fragments thereof.

Claim 11 (currently amended): A eukaryotic cell ~~modified to contain the expression system of claim 1~~ comprising an exogenous nucleic acid encoding a phytase enzyme, wherein the nucleic acid is operably linked to a transcriptional control sequence and the phytase enzyme (i) is encoded by a nucleic acid comprising a sequence as set forth in SEQ ID NO:1, (ii) comprises an amino acid sequence as set forth in SEQ ID NO:2, or, (iii) comprises a sequence as set forth in SEQ ID NO:2 with conservative amino acid substitutions, wherein conservative amino acid substitutions comprise replacements, one for another, among the aliphatic amino acids Ala, Val, Leu and Ile, or, interchange of the hydroxyl residues Ser and Thr, or, exchange of the acidic residues Asp and Glu, or, substitution between the amide residues Asn and Gln, or, exchange of the basic residues Lys and Arg, or, replacements among the aromatic residues Phe, Tyr, or any combination thereof, or active fragments thereof.

Claim 12 (currently amended): A ~~[[plant]] cell or the cells of plant parts or intact plants modified to contain the expression system of claim 1~~ comprising an exogenous nucleic acid encoding a phytase enzyme, wherein the nucleic acid is operably linked to a transcriptional control sequence and the phytase enzyme (i) is encoded by a nucleic acid comprising a sequence as set forth in SEQ ID NO:1, (ii) comprises an amino acid sequence as set forth in SEQ ID NO:2, or, (iii) comprises a sequence as set forth in SEQ ID NO:2 with conservative amino acid substitutions, wherein conservative amino acid substitutions comprise replacements, one for another, among the aliphatic amino acids Ala, Val, Leu and Ile, or, interchange of the hydroxyl residues Ser and Thr, or, exchange of the acidic residues Asp and Glu, or, substitution between the amide residues Asn and Gln, or, exchange of the basic residues Lys and Arg, or, replacements among the aromatic residues Phe, Tyr, or any combination thereof, or active fragments thereof.

Claim 13 (currently amended): A method ~~[[to produce a microbial]]~~ for making a phytase in a [[plant]] cell [[, plant part or plant which method comprises]] comprising:

(a) culturing the ~~[[plant]] cell [[, plant part or plant]]~~ of claim 12 under conditions wherein the exogenous nucleic acid encoding the phytase enzyme [[said first nucleotide sequence]] is expressed ~~;~~ and

~~(b) converting said plant cells, plant parts or plants into a composition suitable for animal feed.~~

Claim 14 (withdrawn): A feed composition for animals which comprises the plant seeds, plant cells, plant parts or plants of claim 13 in admixture with phytate-containing foodstuff.

Claim 15 (withdrawn): A method to treat a human or an animal able to benefit from digestive enhancement by the activity of an exogenous phytase enzyme, which method comprises orally administering to said human or animal an amount of plant seeds, plant cells, plant parts or plants of a transgenic plant effective to provide the phytase activity in said human's or animal's digestive tract, wherein said plant has been modified to contain an expression vector which expresses a nucleotide sequence encoding said phytase enzyme in its seeds, cells or plant parts.

Claim 16 (new): An expression system for making a polypeptide having phytase activity comprising a host cell and an exogenous nucleic acid, wherein the host cell is capable of expressing the exogenous nucleic acid, and the exogenous nucleic acid encodes the polypeptide having phytase activity, and the polypeptide having phytase activity (i) is encoded by a nucleic acid comprising a sequence as set forth in SEQ ID NO:1, (ii) comprises an amino acid sequence as set forth in SEQ ID NO:2, or, (iii) comprises a sequence as set forth in SEQ ID NO:2 with conservative amino acid substitutions, wherein conservative amino acid substitutions comprise replacements, one for another, among the aliphatic amino acids Ala, Val, Leu and Ile, or, interchange of the hydroxyl residues Ser and Thr, or, exchange of the acidic residues Asp and Glu, or, substitution between the amide residues Asn and Gln, or, exchange of the basic residues Lys and Arg, or, replacements among the aromatic residues Phe, Tyr, or any combination thereof, or active fragments thereof.

Claim 17 (new): The expression system of claim 16, wherein the exogenous nucleic acid is operably linked to a transcriptional control sequence.

Claim 18 (new): The expression system of claim 7 wherein said plant cell is a higher plant cell.

Claim 19 (new): The expression system of claim 8 wherein the signal peptide is a secretory signal peptide.

Claim 20 (new): The expression system of claim 1 or claim 16, wherein the nucleic acid further comprises a promoter sequence, a secretory sequence, a stabilizing sequence, a targeting sequence or a termination sequence.

Claim 21 (new): The expression system of claim 1 or claim 16, wherein the nucleic acid further comprises a vector.

Claim 22 (new): The method of claim 21, wherein the vector comprises a cloning vector, an expression vector, a bacterial vector, a plasmid, a viral particle, a phage, chromosomal DNA sequences, nonchromosomal DNA sequences, synthetic DNA sequences, a vaccinia vector, an adenovirus vector, a fowl pox virus, a pseudorabies vector or a combination thereof.

Claim 23 (new): The vector of claim 2, wherein the vector comprises a cloning vector, an expression vector, a bacterial vector, a plasmid, a viral particle, a phage, chromosomal DNA sequences, nonchromosomal DNA sequences, synthetic DNA sequences, a vaccinia vector, an adenovirus vector, a fowl pox virus, a pseudorabies vector or a combination thereof.

Claim 24 (new): The method of claim 11, wherein the eukaryotic cell is a plant cell.

Claim 25 (new): The method of claim 24, wherein the plant cell is a higher plant cell.

Claim 26 (new): The method of claim 24, wherein the plant cell comprises a seed.

Claim 27 (new): The method of claim 24, wherein the plant cell comprises an edible flower, a cauliflower, an artichoke, a fruit, an apple, a banana, a berry, a currant, a cherry, a cucumber, a grape, a lemon, a melon, a nut, an orange, a peach, a pear, a plum, a strawberry, a tomato, a leaf, an alfalfa, a cabbage, an endive, a leek, a lettuce, a spinach, a tobacco, a root, an arrowroot, a beet, a carrot, a cassava, a turnip, a radish, a yam, a sweet potato, a bean, a pea, a soybean, a wheat, a barley, a corn, a rice, a rapeseed, a millet, a sunflower, an oat, a tuber, a kohlrabi or a potato.

Claim 28 (new): The method of claim 13, further comprising converting the cell into a composition suitable for animal feed.

Claim 29 (new): The method of claim 13, wherein the cell is a prokaryotic cell or a eukaryotic cell.

Claim 30 (new): The method of claim 29, wherein the eukaryotic cell is a plant cell.

Claim 31 (new): The method of claim 30, wherein the plant cell is a higher plant cell.

Claim 32 (new): The method of claim 30, wherein the plant cell comprises a seed.

Claim 33 (new): The method of claim 30 wherein the plant cell comprises an edible flower, a cauliflower, an artichoke, a fruit, an apple, a banana, a berry, a currant, a cherry, a cucumber, a grape, a lemon, a melon, a nut, an orange, a peach, a pear, a plum, a strawberry, a tomato, a leaf, an alfalfa, a cabbage, an endive, a leek, a lettuce, a spinach, a tobacco, a root, an

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arrowroot, a beet, a carrot, a cassava, a turnip, a radish, a yam, a sweet potato, a bean, a pea, a soybean, a wheat, a barley, a corn, a rice, a rapeseed, a millet, a sunflower, an oat, a tuber, a kohlrabi or a potato.

Claim 34 (new): The expression system of claim 16, wherein the phytase activity comprises hydrolyzing inorganic phosphate from phytate.